GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

64-O

LEGEND

PRECAMBRIAN

8 — 8a, gabbro, metagabbro; 8b, hornblende–pyroxenite

7 — Foliated to massive granite; 7a, porphyritic fluorite-bearing granite

6 — Granite-gneiss, migmatite, undifferentiated metasedimentary gneiss and granite

5 — Metasedimentary gneiss: biotite–quartz gneiss, garnet-biotite gneiss, hornblende gneiss; minor cordierite gneiss; includes migmatite locally

4 — Metasedimentary schist: biotite schist, in part nodular; biotite-garnet-quartz schist; biotite quartzite; minor hornblende schist; 4a, garnet-cordierite schist, sillimanite-cordierite schist; 4b, graphitic schist, commonly with associated impure limestone

3 — Quartzite, siltstone, sandstone; minor calcareous and argillaceous rocks; 3a, mainly pink to grey medium-grained quartzite; 3b, limestone, dolomite, cherty dolomite; marble, skarn

2 — Plagioclase amphibolite, pyroxene granulite, meta-diorite, hornblende-rich gneiss

1 — Buff to pinkish brown granulite, granite-gneiss, and gneissic granite, undivided; minor amphibolite, metasedimentary gneiss; 1a, mainly granulite; 1b, mixed granulite and granite; 1c, granulite and metasedimentary gneiss

Drift-covered area, few or no outcrops

Geological boundary (approximate or assumed)

Limit of geological mapping

Bedding (direction of dip known, upper side of bed unknown; inclined, vertical)

Gneissosity, schistosity, stratiform foliation (inclined, vertical, dip unknown or variable)

Lineation (plunging)

Glacial striae (direction of ice movement indicated)

Esker

Occurrence of tourmaline-bearing pegmatite ×

Occurrence of quartz-magnetite iron formation Fe×

Geology by W. L. Davison, 1962

Cartography by the Geological Survey of Canada, 1963

Cabin

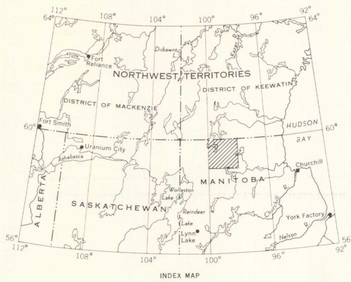
Rapid

Marsh

Height in feet above mean sea-level 1100

Base-map by the Surveys and Mapping Branch, 1960

Mean magnetic declination, 13° 06' East, increasing 0.2' annually. Readings vary from 11° 03' E in the NE corner to 14° 56' E in the SW corner of the map-area



INDEX MAP

PUBLISHED, 1963
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MAP 35-1963
GEOLOGY
MUNROE LAKE
MANITOBA

Scale: One Inch to Four Miles = 1/253,440
Miles
4 2 0 4 8 12

DESCRIPTIVE NOTES

Much of the area has low relief, but prominent eskers rise, in places, 100 feet or more above surrounding country. Low boulder ridges, interspersed with swampy ground and lakes, are found nearly everywhere. Several ridges of well exposed bedrock occur along and near the southern boundary, but elsewhere, with few exceptions, outcrops are small and widely separated.

Highly metamorphosed and deformed granulite and gneiss of map-unit 1 are considered to be the oldest rocks in the area; a part of the associated granite, however, may be younger than rocks of units 3–5. Pink to red granite, granite-gneiss, or pegmatite, transgress granulite in most of the observed exposures. Granulite may be well banded or massive, and transitional varieties, between granulite and granite-gneiss on the one hand, and between granulite and metasedimentary gneiss on the other, are common. Typical granulite ranges in grain-size from medium to fairly coarse; it contains small amounts of hypersthene and hornblende, set in a mosaic of perthite, andesine, and quartz; magnetite is a common accessory.

Amphibolite and associated mafic rocks (2) are commonly well banded, and show much variation in composition and texture over short distances. Their origin is uncertain, but the presence of pyroxene granulite suggests a close relationship with rocks of unit 1. Plagioclase and hornblende are essential constituents; in addition, hypersthene, clinopyroxene, or biotite may be locally present. Minor schistose layers may have rusty surfaces, owing to breakdown of small amounts of magnetite and pyrrhotite.

Fine-grained, finely bedded, grey to black sedimentary rocks (3) are typically poorly exposed, and may underlie much of the drift-covered area to the north and northeast of Munroe Lake. Graphitic siltstone and limestone beds are present near Nueltin Lake. More indurated quartzite (3a) comprises most of the exposures on the south and southwest flanks of the belt that extends westward from Munroe Lake; this quartzite is generally pale in colour, indistinctly bedded, and strongly jointed. Feldspathic, garnetiferous, and biotite-bearing varieties occur locally, and pink feldspathic quartzite may enclose small patches of pink to red granite. Although the indurated quartzite is judged to be part of the same sequence as the finer-grained sediments, it could represent a distinctly older series. Carbonate rocks (3b) in mappable bodies are mainly light-coloured and medium-grained granular limestone (or marble) and cherty dolomite; they are most conspicuous in zones near quartzite (3a), but the inter-relationship is unknown.

Metasedimentary schist (4) is evidently derived, for the most part, from sedimentary rocks (3), with which contacts are gradational. Biotite schist is characteristic; it consists of prominent biotite flakes in a finer-grained matrix of quartz, orthoclase or microcline, and oligoclase, with sporadic garnet, muscovite, and amphibole. Nodules in biotite schist are made up of orthoclase, sericite, or violet-grey to purplish cordierite. Hornblende schist occurs locally, notably in the vicinity of Askey Lake. Dark, granular, fine-grained quartzite, which may contain garnet and biotite, is intercalated with schist in many places.

Schist and quartzite (4) grade, across broad zones, into metasedimentary gneiss (5). Quartzose gneiss, with or without biotite and/or garnet, is characteristic and abundant. It is generally light in colour, as is associated quartzofeldspathic gneiss; both are marked by minor compositional, textural, and colour changes from layer to layer. Feldspars include microcline, orthoclase, and perthite, with plagioclase ranging from albite-oligoclase to andesine. More highly metamorphosed gneiss contains hornblende, and in the highest grade may closely resemble granulite (1), at least outwardly; thus, further study might necessitate adjustment of map-boundaries where units 1 and 5 are outlined.

With increasing granitic content, metasedimentary schist (4) and gneiss (5) pass into migmatite and granite-gneiss (6). Granite-gneiss is inhomogeneous, being commonly characterized by the presence of patches, lenses, and streaks of biotite, or of other sedimentary remnants, enclosed by gneissic to nearly massive granite. Pegmatite is usually present, and makes up the major part of some outcrops. In the granitic part, the chief constituents are quartz and microcline, which may be accompanied by smaller amounts of plagioclase (generally oligoclase), and less biotite or chlorite. Pink to red granitic varieties are typical; in many occurrences a reddish tint is given by the presence of deep red spots and stains that have resulted from oxidation of magnetite and pyrite.

Granite (7) is mainly grey or pink, medium to coarse grained, and gneissic to massive; it may be equigranular or porphyritic. Judged by the available evidence, the granite is younger than all rocks of units 1–5, and closely related to the granitic part of unit 6, although possibly more than one age of granite exists in the map-area. Fluorite-bearing, grey to pink porphyritic granite (7a) is medium to very coarse grained, and gneissic in part. Phenocrysts of microcline and microcline-perthite, up to 2 inches long, commonly make up 40 to 70 per cent of the rock; the rest consists of smaller grains of microcline, dark quartz, biotite, oligoclase, and the accessory minerals apatite, magnetite, and deep purple fluorite. In the coarsest phase, masses of fluorite may exceed ½ inch in diameter but, for the most part, fluorite is visible only in widely scattered small grains. The granite is intrusive into gneiss (5). A K/Ar determination has given an age of 1,735 m.y. for a similar granite in an adjacent map-area[1]. No fluorite has been found in other granites of map-unit 7, although several possess local phases that closely resemble the fluorite-bearing variety. Apart from this, granite (7) is remarkably consistent in mineral composition, even though it commonly shows considerable variation in structure, texture, and colour.

Poorly exposed gabbro (8a) near Nueltin Lake is coarse grained, dark grey to black, and has rusty weathered surfaces. Pyroxene and plagioclase, both more or less altered, are the main constituents; disseminated magnetite, pyrite, pyrrhotite, and chalcopyrite occur throughout. The gabbro is cut by small quartz veins, and contains patchy inclusions of altered feldspar, garnet, and quartz. A foliated mafic rock (8a), possibly once diabasic, occurs northeast of Blevins Lake. Elongate blades of amphibole, with parallel orientation, have replaced most of the pyroxene, of which only small remnants remain; the remainder is largely labradorite. Sparsely disseminated sulphides, including chalcopyrite, are present in places. Grey-black, fine- to coarse-grained hornblende–pyroxenite (8b) grades into feldspathic amphibolite and hornblende-schist, possibly of map-unit 4, although age relationships to these and other rocks of the area are unknown. The hornblende–pyroxenite is slightly rusty on weathered surfaces, owing to the oxidation of a small content of magnetite, pyrrhotite, and chalcopyrite, most noticeable near thin quartz veins. Blades of actinolite, aligned parallel to prominent partings, and dark green spinel accompany clinopyroxene, which is the main constituent.

Structures are difficult to decipher, owing to the general lack of continuous outcrops. Trends, lineations, and minor fold-axes suggest that northeast to easterly plunges predominate. Locally, structures show a tendency to conform to the outlines of granitic bodies.

No occurrences of definite economic interest have been recognized in the map-area. The disseminated sulphides in rocks of unit 8 point only to the possibility that greater concentrations of sulphides may be present, particularly near the northern boundary east of Nueltin Lake. For the most part, heavy drift-cover obscures bedrock near these localities.

Aeromagnetic maps, covering all but the eastern one-quarter of the map-area, are available from the Geological Survey. Two anomalies of relatively high intensity, in the region southwest of Lowry Lake, are indicated on Map 1090 G; these correspond to mapped occurrences of gabbro (8a) and of quartz-magnetite iron formation. South of Askey Lake (Map 1086 G), a minor anomaly is apparently related to the presence of vein-like masses of iron-rich garnet in quartzite. Elsewhere, scarcity of outcrop makes correlation of magnetic anomalies with particular rock-types difficult, although material in the drift commonly suggests that the magnetic effects are caused by low concentrations of sulphides and/or magnetite.

[1] Fraser, J. A.: Kasmere Lake, Manitoba; Geol. Surv., Canada, Map 31-1962, map-unit 7b, (1962).

MAP 35-1963
MUNROE LAKE
MANITOBA
64-O